Patent Claims

1. Device for controlling a thick matter pump with two conveyor cylinders (50, 50') communicating via two end openings (52) in a material supply container (54), operated in counter stroke by a hydraulic reversible pump (6) via hydraulic drive cylinders (5, 5') control by the reversible pump, with a hydraulically actuated pipe switch (56) provided within the material supply container (54), which pipe switch is on its inlet side alternatingly connectable to one of the openings (52) of the conveyor cylinders (50, 50') freeing the respective other opening and on the outlet side is connected with a conveyor conduit (58), wherein the drive cylinders (5, 5') are hydraulically connected at one end via respectively one hydraulic conduit (11, 11') to a connector of the reversible pump (6) and on their other end are hydraulically connected with each other via an oscillating oil conduit (12), with at least two cylinder switch sensors (20, 20'; 22, 22') in predetermined separation from each other and spaced from the rod ends and/or base ends of the drive cylinders (5, 5') and sensitive to the passage by of a piston (8, 8') of the drive cylinder, and with a device (18) responsive to the output signal of selected cylinder switch sensor for switching or reversing the reversible pump (5) and the pipe switch (56) after completion of a piston stroke, thereby characterized, that the device is a computer assisted reversing device including a measurement and evaluation routine for determining, by measurement or computation, the temporal displacement of the piston on its way between the two cylinder ends, as well as for computing therefrom a

derived initiation time for the subsequent reversing of the reversible pump and the pipe switch.

2. Device according to Claim 1, thereby characterized, that the measurement and evaluation routine includes an algorithm for determining the time of the piston passage at the location of the cylinder switch sensors as well as for computing a therefrom derived initiation time point for a reversing of the reversible pump and the pipe switch at each piston stroke, taking into consideration a predetermined or computed brake time of the piston prior to a respective impact at the end of the cylinder.

3. Device according to Claim 1 or 2, thereby characterized, that the measurement and evaluation routine includes an algorithm for computing the speed of the piston on its way between the cylinder switch sensors and a therefrom derived initiation point for the next reversing process, taking into consideration a predetermined or computed brake time of the piston prior to the respective impact at the end of the cylinder.

4. Device according to one of Claims 1 through 3, thereby characterized, that the measurement and evaluation routine responds to a, preferably input via a remote control, target value for the conveyed amount of the reversible pump and includes an algorithm for determining the characteristic of the piston speed and the therefrom derived initiation point for the next reversal process according to the measure of the current set target value.

5. Device according to one of Claims 1 through 4, thereby characterized, that the measurement and evaluation routine includes an algorithm for determining the brake time or the brake path of the piston according to the magnitude of the instantaneously measured or computed piston speed and the therefrom derived initiation point for the reversal process.

6. Process for controlling a thick matter pump with two conveyor cylinders (50, 50') communicating with two end openings (52) in a material supply container (54), operated in counter stroke via at least one hydraulic reversible pump (6) and via hydraulic drive cylinders (5, 5') control thereby, with a pipe switch provided within the material supply container (54), on its inlet side alternatingly connectable to the openings (52) of the conveyor cylinders (50, 50') freeing the respective other opening and on the outlet side connected with a conveyor conduit (58), wherein each conveyance stroke is monitored by at least two cylinder switch sensors (20, 20'; 22, 22') at sensor positions spaced with predetermined separation from each other and from the rod and base side ends of the drive cylinder (5, 5') and initiating a reversing the reversible pump (5) and the pipe switch (56), thereby characterized, that the temporal displacement course of the piston on its way between the two cylinder ends is measured and/or computed and therefrom the initiation time point for the respective next reversal process is derived.

7. Process according to Claim 6, thereby characterized, that the passing of the pistons at the location of the cylinder switch sensors are detected in time relation to each other

and that therefrom the initiation point for the respective following reversal of the reversible pump and the pipe switch is calculated, taking into consideration a predetermined or computed brake time of the piston prior to the respective impacting at the end of the cylinder.

8. Process according to Claim 6 or 7, thereby characterized, that the speed of the piston on its way between the selected cylinder switch sensors is calculated and that therefrom the initiation point for the respective subsequent reversal of the reversible pump and the pipe switch is derived taking into consideration a predetermined or computed brake time of the piston prior to the respective impacting at the end of the cylinder.

9. Process according to one of Claims 6 through 8, thereby characterized, that the movement of the piston over time is changed via a remote control input target value for the conveyed amount, and that from the computed movement sequence of the piston according to the value of the input target value, taking into consideration a thereby modified brake time, the initiation point for the subsequent reversal process is derived.

10. Process according to one of Claims 6 through 9, thereby characterized, that the brake time or brake path of the piston is determined based on the collective or computed piston speed, respectively taking into consideration the device specific reaction time and reverse time of the reversible pump, and therefrom the respective next initiation point is computed.